

Deirdre Wendel Title and Abstract, GEM 2011

Turbulent Reconnection Rates from Cluster Observations in the Magnetosheath

Abstract: The role of turbulence in producing fast reconnection rates is an important unresolved question. Scant *in situ* analyses exist. We apply multiple spacecraft techniques to a case of nonlinear turbulent reconnection in the magnetosheath to test various theoretical results for turbulent reconnection rates. To date, *in situ* estimates of the contribution of turbulence to reconnection rates have been calculated from an effective electric field derived through linear wave theory. However, estimates of reconnection rates based on fully nonlinear turbulence theories and simulations exist that are amenable to multiple spacecraft analyses. Here we present the linear and nonlinear theories and apply some of the nonlinear rates to Cluster observations of reconnecting, turbulent current sheets in the magnetosheath. We compare the results to the net reconnection rate found from the inflow speed. Ultimately, we intend to test and compare linear and nonlinear estimates of the turbulent contribution to reconnection rates and to measure the relative contributions of turbulence and the Hall effect.